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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 36

Application Number: 09/194,112
Filing Date: November 23, 1998
Appellant(s): ONUKI ET AL.

Mr. Andrew D. Meikle (Reg. No. 32,868)
For Appellant

EXAMINER'S ANSWER

MAILED
FEB 23 2004
GROUP 3700

This is in response to the appeal brief filed 7 November 2003.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The appellant's statement in the brief that certain claims do not stand or fall together is not agreed with because it states that each group raises different issues yet group 1 and 2 state the same issues as shown on page 6 of the Brief.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,896,642	<i>Peker et al</i>	4-1999
5,611,742	<i>Kobayashi</i>	3-1997
5,261,663	<i>Anderson</i>	11-1993
5,601,501	<i>Kobayashi</i>	2-1997
5,792,005	<i>Sieleman</i>	8-1998

The following is the prior art not relied on but cited as to develop what is known in the art by one skilled in the art at the time of the invention. The examiner used these findings to conclude the meaning of prior art references relied on to persons of ordinary skill in the art and the motivation those references would provide to such persons (In re Berg, 65 USPQ2d 2003 (Fed. Cir. 2003)).

5,643,103	Aizawa	7-1997
4,398,965	Campau	8-1983
5,346,217	Tsuchiya	9-1994
5,378,295	Yamashita	1-1995
5,499,814	Lu	3-1996
5,569,337	Yoshida	10-1996

1-254179, Japan, Oct 11, 1989, DERWENT, BASIC-ABSTRACT.

49-40211, Japan, 15 April, 1974, DERWENT, BASIC-ABSTRACT.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC ' 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. Claims 21, 23-25, and 30 stand rejected and claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peker.

Peker discloses a golf club head having a hitting face formed of a metallic amorphous metal, an amorphous alloy of zirconium base, Ni, Al, Cu, Hf, tensile strength 1.9 GPa (194 kgf/mm²) (Col. 4 Lns. 12-43), a material meeting the formula $M(a)X(b)$ with $65 \leq a \leq 100$ and $0 \leq b \leq 35$ in the form of $M(\text{Zr/Ti/Be/Cu/Ni})$ of 100 (Col. 4, Lns. 13-16), a material meeting the formula $\text{Zr}(c)\text{M}(d)\text{X}(e)$ with $20 \leq c \leq 80$, $20 \leq d \leq 80$, and $0 \leq e \leq 35$ in the form of Zr of 41.2, $M(\text{Ti/Be/Cu/Ni.})$ of 58.8, and $X(\text{Hf})$ of 0 (Col. 4, Lns. 23-27), and material meeting the formula $\text{Zr}(c)\text{M}(d)\text{X}(e)$ with $50 \leq c \leq 75$, $25 \leq d \leq 50$, $0 \leq e \leq 1$ in the form Zr of 60, $M(\text{Al/Ni})$ of 40 and $X(\text{Hf})$ of 0 (Col. 4, Lns. 39-43) and an iron head (Fig. 6). Clearly the hitting face material has a Young's modulus and a hardness and one skilled in the art in manufacturing a hard face with mixtures of elements of Zr/Ti/Be/Cu/Ni/Hf would have selected a composition having a suitable Young's modulus and tensile strength in which Young's modulus and tensile strength meets the relationships in claim 30, a Young's modulus of 5,000 to 10,000 kgf/mm², and a tensile strength of 105 to 175 kgf/mm² are included.

The difference between the claims and Peker is that Peker does not disclose a Young's modulus of 5,000 to 10,000 kgf/mm², a tensile strength of 105 to 175 kgf/mm², a relationship between Young's modulus and tensile strength as defined by claim 30.

It would have been obvious to modify the face of Peker to have a Young's modulus and tensile strength as defined by the claims in order to have face which has a sufficient flex for a specific golfer.

3. Claims 1-20, 22, 26-29 and 31-32 stand rejected and claims 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peker as applied to claims 21, 23-25, 30, and 38 above, and further in view of Kobayashi (5,611,742).

Clearly the hitting face material of Peker has a Young's modulus and a hardness and one skilled in the art in manufacturing a hard face with mixtures of elements of Zr/Ti/Be/Cu/Ni/Hf would have selected a composition having a suitable hardness and Young's modulus in which a hardness and Young's modulus which meets the relationship in claim 5 and a Vickers hardness of 400 to 1,000 HV are included.

Peker lacks a hitting face having at least partially a hitting portion which consists of a metallic material with a thickness of 1 to 3 mm, a back of a hitting portion being not supported by a support member, a Vickers hardness of 400 to 1,000 HV, a relationship of Young' modulus and hardness as defined by claim 5, and a wood head.

Kobayashi discloses a wood head (abstract) having a face made of a metallic alloy with a thickness being 2-3 mm (Claim 2) and a head wherein a back of a hitting portion is not supported by a support member (Fig. 7) in order to have a larger sweet area without damaging a strength of a head (Abstract). In view of the patent of Kobayashi it would have been obvious to modify the head of Peker to have a hitting face having at least partially a hitting portion which consists of a metallic material with a

thickness of 2 to 3 mm and to have a back of a hitting portion being not supported by a support member in order to have a larger sweet area without damaging a strength of a head. Also in view of the patent of Kobayashi it would have been obvious to modify the head of Peker to have a head being a wood in order to utilize the advantages of the material of Peker for wood heads.

In addition, it would have been obvious to have a Vickers hardness of 400 to 1,000 HV, and a relationship of Young' modulus and hardness as defined by claim 5 in order to have a face which maximizes the transfer of energy to a ball at impact.

4. Claims 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peker and Kobayashi (5,611,742) as applied to claims 1-20, 22, 26-29 and 31-37 above, and further in view of Anderson.

Peker lacks a head body providing a face mounting part for attaching a face plate comprising a periphery of a hitting face and a face mounting part being provided with a step down zone. Anderson discloses a head body providing a face mounting part for attaching a face plate comprising a periphery of a hitting face and a face mounting part being provided with a step down zone (Fig. 12). In view of the patent of Anderson it would have been obvious to modify the head of Peker to have a head body for a wood providing a face mounting part for attaching a face plate comprising a periphery of a hitting face and a face mounting part being provided with a step down zone in order to ensure the face is more securely attached to the body.

5. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peker as applied to claims 21, 23-25, 30, and 38 above, and further in view of Anderson.

Peker lacks a head body providing a face mounting part for attaching a face plate comprising a periphery of a hitting face and a face mounting part being provided with a step down zone. Anderson discloses a hollow wood head body providing a face mounting part for attaching a face plate comprising a periphery of a hitting face and a face mounting part being provided with a step down zone (Fig. 12). In view of the patent of Anderson it would have been obvious to modify the head of Peker to have a wood head body providing a face mounting part for attaching a face plate comprising a periphery of a hitting face and a face mounting part being provided with a step down zone in order to utilize the advantages of the material of Peker for wood heads and in order to ensure the face is more securely attached to a wood body.

6. Claims 1, 5, and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peker as applied to claims 21, 23-25, 30, and 38 above, and further in view of Kobayashi (5,601,501) and Sieleman.

Clearly the hitting face material of Peker has a Young's modulus and a hardness and one skilled in the art in manufacturing a hard face with mixtures of elements of Zr/Ti/Be/Cu/Ni/Hf would have selected a composition having a suitable hardness and Young's modulus in which a hardness and Young's modulus which meets the relationship in claim 5 and a Vickers hardness of 400 to 1,000 HV are included.

Peker lacks a hitting face having at least partially a hitting portion which consists of a metallic material with a thickness of 1 to 3 mm, a Vickers hardness of 400 to 1,000 HV, a relationship of Young' modulus and hardness as defined by claim 5, and a face plate constructed with a thicker central part with a periphery part whose thickness reduces gradually outward.

Kobayashi discloses an iron head (abstract) having a face made of a metallic alloy with a thickness being 2-3 mm (Claim 2), a head body, and a face plate (Fig. 5) in order to have a larger sweet area without damaging a strength of a head (Abstract). In view of the patent of Kobayashi it would have been obvious to modify the head of Peker to have a hitting face having at least partially a hitting portion which consists of a metallic material with a thickness of 2 to 3 mm and to have a back of a hitting portion being not supported by a support member in order to have a larger sweet area without damaging a strength of a head.

Sieleman discloses a face within the surrounding edge constructed with a thicker central part with a periphery part whose thickness reduces gradually outward (Figs. 4-6) in order to cause the ball to go far when impacted at the center (Col. 2, Lns. 4-18). In view of the patent of Sieleman it would have been obvious to modify the head of Peker to have a face plate constructed with a thicker central part with a periphery part whose thickness reduces gradually outward in order to cause the ball to go far when impacted at the center.

In addition, it would have been obvious to have a Vickers hardness of 400 to 1,000 HV, and a relationship of Young's modulus and hardness as defined by claim 5 in order to have a face which maximizes the transfer of energy to a ball at impact.

Response to Arguments

7. The arguments that it is improper to use the patent of Peker since Peker fails to disclose a Young's modulus and tensile strength in which Young's modulus and tensile strength meets the relationships in claim 1, a Young's modulus of 3,000 to 12,000 kgf/mm², and a tensile strength of 105 to 175 kgf/mm² are disagreed with.

Obviousness can be established to modify the teaching of prior art to produce the claimed invention by motivation in the knowledge generally available to one of ordinary skill in the art (In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)). In addition, inherent teaching of a prior art reference may be relied upon in a rejection (In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995)). Peker discloses the alloys which meet the percentages as defined in the claims (Claims 14-19). Clearly the face of Peker will have inherent properties as Young's modulus, tensile strength and hardness. Since the material of Peker is substantially the same as the material claimed by the applicant in composition, it would be obvious to have the face of Peker having substantially the same properties as claimed. In addition, these properties would be suitable selections for one skilled in the art to meet the needs of a specific golfer out of the numerous different types of golfers with different needs. The arguments that it is

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improper to use the patent of Kobayashi '742 since Kobayashi '742 fails to disclose a Young's modulus and tensile strength in which Young's modulus and tensile strength meets the relationships in claim 1, a Young's modulus of 3,000 to 12,000 kgf/mm², and a tensile strength of 105 to 175 kgf/mm² are disagreed with. Kobayashi '742 was not used to show these elements of structure but that it is known to make heads where a back of a hitting portion is not supported by a support member with thicknesses between 1 to 3 mm. Clearly the head structure of Kobayashi '742 is a common head design which the head of Peker would benefit from. The argument that it is improper to combine the references of Peker and Kobayashi '742 since the method of forming a head of Peker requires a support is disagreed with. There are numerous ways for manufacturing a head and forming the individual parts apart from one another prior to assembly it the most common method. The face material of Peker is a suitable face material for head design of Kobayashi '742. The argument that it is improper to combine the references of Peker and Kobayashi '742 since Peker discloses an iron and Kobayashi '742 discloses a wood is disagreed with. Both irons and woods require materials for hitting surfaces which Peker provides. The argument that it is improper to combine the references of Peker and Kobayashi '742 since Peker and Kobayashi '742 discloses different metallic alloys for a hitting face is disagreed with. Every head which has a face would have a face thickness. Kobayashi '742 discloses a suitable face thickness use in the art of golf. The argument that it is improper to use the metal composition in Peker which was not mentioned as a use for golf club heads is disagreed with. Peker is concerned with improving the surface of a metallic material and one of

the examples is a golf head. Each of the different embodiments of metal composition with this improved surface would be an obvious and suitable selection.

(11) Response to Argument

In the arguments filed 7 November 2003, the appellant argues:

1. It is improper to use the reference of Peker since Peker only discloses a tensile strength of 164 kgf/mm² which is outside the claimed range.
2. It is improper to use the reference of Peker since the examiner has not described that "specific golfer" or indicate what is meant by "sufficient flex". As such one of ordinary skill in the art would have no idea who that "specific golfer" or "sufficient flex" would be.
3. It is improper to use the reference of Peker since tensile strength is not an inherent property that is reliant only on the composition of the metal but also on the methods of annealing and forging. As such one would not expect to arrive at the instant invention by the disclosure of Peker without a disclosure of how that metal composition is manufactured.
4. It is improper to use the reference of Peker since the composition of Peker is not the same composition disclosed in the instant case as shown in attached Appendix D.

Peker does not disclose how the composition of Peker needs to be modified to arrive at the instant invention.

5. It is improper to combine the references of Peker and Kobayashi (742) since Kobayashi (742) discloses a tensile strength outside of the claimed range.

6. It is improper to combine the references of Peker and Kobayashi (742) since Kobayashi (742) does not disclose or suggest modifying the tensile strength to achieve the claimed value.

7. It is improper to combine the references of Peker and Kobayashi (742) since tensile strength and hardness are not inherent properties as shown in Appendix C. Kobayashi (742) does not disclose or suggest modifying the tensile strength to achieve the claimed values since it is not an inherent property.

8. It is improper to combine the references of Peker and Kobayashi (742) since hardness is not an inherent property but depends on the surface area of an impression that a load generates, which depends on the composition, and which depends on how an alloy is manufactured.

9. It is improper to combine the references of Peker and Kobayashi (742) since neither disclose the Young's modulus as defined by the claims.

10. It is improper to use the reference of Anderson since Anderson says nothing of tensile strength.

11. It is improper to use the reference of Sieleman since Sieleman says nothing of tensile strength, Young's modulus or Vickers hardness.

12. With respect to item 1, the argument that it is improper to use the reference of Peker since Peker only discloses a tensile strength of 164 kgf/mm² which is outside the claimed range is disagreed with. Peker discloses a specific example which has the stated tensile strength of 164 kgf/mm² (Col. 4, Lns. 23-29) however Peker leaves room to provide substitution for the elements of the composition (Col. 4, 16-23) and also gives a very wide range of percentages for each element in the composition (Col. 4, Lns. 33-43). Clearly this one specific example does not limit the disclosure of Peker to form only compositions which are limited to a tensile strength of 164 kfg/mm². It was just one specific example. The range of atomic percentages and allowed substitutions as well as the different methods of manufacturing using this material as stated by the applicant would all affect the tensile strength. As such these variables would allow an artisan skilled in the art to produce obvious modifications to this composition and obvious methods of manufacturing in order to obtain obvious tensile strength values.

13. With respect to item 2, the arguments that it is improper to use the reference of Peker since the examiner has not described that "specific golfer" or indicate what is meant by "sufficient flex" and as such one of ordinary skill in the art would have no idea who that "specific golfer" or "sufficient flex" would be are disagreed with. Obviousness can be established to modify the teaching of prior art to produce the claimed invention by motivation in the knowledge generally available to one of ordinary skill in the art (In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)). In addition, inherent teaching of a prior art reference may be relied upon in a rejection (In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995)). Peker discloses the alloys which meet the percentages as defined in the claims (Claims 14-19). Clearly the face of Peker will have inherent properties as Young's modulus, tensile strength and hardness dependent on the composition and the method of manufacturing as the applicant has argued. Since the material of Peker is substantially the same as the material claimed by the applicant in composition, it would have been obvious for one skilled in the art to select suitable properties of this composition based on the composition, obvious modification of the composition disclosed by Peker and the method of manufacturing. Prior art not relied but cited to show what is available in the art clearly shows that the claimed properties are obvious selections in the golf art to one skilled in the art. Aizawa discloses a Young's modulus for different materials for a face plate which are throughout the claimed range (Col. 3, Lns. 57-62). Tsuchiya (Col. 8, Lns. 24-26), Yamashita (Col. 9, Lns. 63-66), Lu (Col. 6, Lns. 4-17), Yoshida (Col. 4, Lns. 6-12) and Campu (Col. 6, Lns. 24-27) disclose a tensile strength for different materials for a face

plate which are throughout the claimed range. JP 1-254179 discloses a range of suitable Rockwell hardnesses for a golf club head face (DERWENT BASIC ABSTRACT) which would be equivalent to the claimed Vickers hardness (JP 49-40211, DERWENT BASIC ABSTRACT). The examiner used these findings to conclude the meaning of the prior art references relied on to persons of ordinary skill in the art and the motivation those references would provide to such persons (In re Berg, 65 USPQ2d 2003 (Fed. Cir. 2003). The properties as claimed are suitable selections for a golfer with the prior art cited supporting the prior art relied as to what was known by one skilled in the art at the time of the invention.

14. With respect to item 3, the argument that it is improper to use the reference of Peker since tensile strength is not an inherent property that is reliant only on the composition of the metal but also on the methods of annealing and forging is disagreed with. It is agreed based on the evidence supplied by the applicant that tensile strength does depend on the method of manufacturing a head. However the examiner maintains the position that the reference of Peker is proper since one skilled in the art would select an obvious and suitable manufacturing process to produce inherent properties which are obvious and suitable selections for a golf club head which would included the claimed values of the properties.

15. With respect to item 4, the argument that it is improper to use the reference of Peker since the composition of Peker is not the same composition disclosed in the

instant case as shown in attached Appendix D is disagreed with. The Brief did not contain an Appendix D and as such the examiner does not know what are the composition differences being argued.

16. With respect to item 5, the argument that it is improper to combine the references of Peker and Kobayashi (742) since Kobayashi (742) discloses a tensile strength outside of the claim range is disagreed with. Kobayashi was not used to show a tensile strength. The composition of Peker and what was known and obvious in the art was used to show tensile strength. Kobayashi was used to show that it is known to have clubs being wood heads of metallic alloys having a thickness as claimed.

17. With respect to item 6, the argument that it is improper to combine the references of Peker and Kobayashi (742) since Kobayashi (742) does not disclose or suggest modifying the tensile strength to achieve the claimed value is disagreed with. See items 13 and 16 above.

18. With respect to item 7, the argument that it is improper to combine the references of Peker and Kobayashi (742) since tensile strength and hardness are not inherent properties as shown in Appendix C and Kobayashi (742) does not disclose or suggest modifying the tensile strength to achieve the claimed value since it is not an inherent property is disagreed with. See items 13 and 16 above.

19. With respect to item 8, the argument that it is improper to combine the references of Peker and Kobayashi (742) since hardness is not an inherent property but depends on the surface area of a load, the composition of the material and the manufacturing process is disagreed with. See items 13 and 16 above.

20. With respect to item 9, the argument that it is improper to combine the references of Peker and Kobayashi (742) since neither disclose the Young's modulus as defined by the claims is disagreed with. Kobayashi was not used to show the obviousness of having the claimed Young's modulus. Peker was used for that. See items 13 and 16 above.

21. With respect to item 10, the argument that it is improper to use the reference of Anderson since Anderson says nothing of tensile strength is disagreed with. Anderson was not used to show a tensile strength. The composition of Peker and what was known and obvious in the art was used to show tensile strength. Anderson was used to show that it is known to have a hollow wood head body providing a face mounting part for attaching a face plate comprising a periphery of a hitting face and a face mounting part being provided with a step down zone. See item 13 above.

22. With respect to item 11, the argument that it is improper to use the reference of Sieleman since Sieleman says nothing of tensile strength, Young's modulus or Vickers hardness is disagreed with. The composition of Peker and what was known and


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obvious in the art was used to show these properties. Sieleman was used to show that it is known to have a face within the surrounding edge constructed with a thicker central part with a periphery part whose thickness reduces gradually outward. See item 13 above.

23. In closing the examiner reiterates that reference of Peker discloses material meeting the formula requirements of the claims. Though the values of the claimed properties are not disclosed, clearly Peker will have these properties of Young's modulus, tensile strength and Vickers hardness. One skilled in the art would select a suitable and obvious manufacturing process to produce suitable and obvious values of these properties which would include the values as defined by the claims. The examiner cited references to show evidence to what is known to one skilled in the art.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


STEPHEN BLAU
PRIMARY EXAMINER

January 26, 2004


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